

## Quantum Communications Transmitter at 775 nm, Phase I

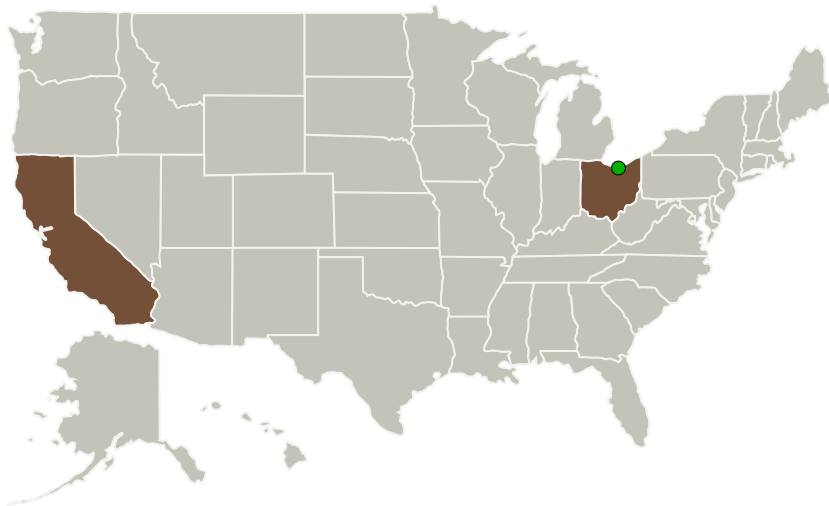
Completed Technology Project (2012 - 2012)




## Project Introduction

We propose a novel new architecture for a quantum communications laser transmitter that is designed for free-space polarization encoded quantum key distribution (QKD) between a spacecraft and a ground based system. The transmitter will operate at 775 nm, a wavelength that has previously been analyzed to be optimize free-space QKD due to the combined influence of atmosphere transition and detection efficiency by Si:APD detectors. Hybrid integration will be used to design and fabricate a compact, rugged, and power efficient module that can meet all of the demanding environment requirements for space based optical components.

## Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Gener8, Inc.	Lead Organization	Industry	Sunnyvale, California
 Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

## Primary U.S. Work Locations

California	Ohio
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## Project Transitions



**February 2012:** Project Start



**October 2012:** Closed out

### Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/138431>)

## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Organization:

Gener8, Inc.

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

Carlos Torrez

### Principal Investigator:

William Bischel

### Co-Investigator:

William Bischel

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## Technology Maturity (TRL)

Start: **1**  
Current: **3**  
Estimated End: **3**



## Technology Areas

### Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - └ TX05.5 Revolutionary Communications Technologies
    - └ TX05.5.2 Quantum Communications

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System